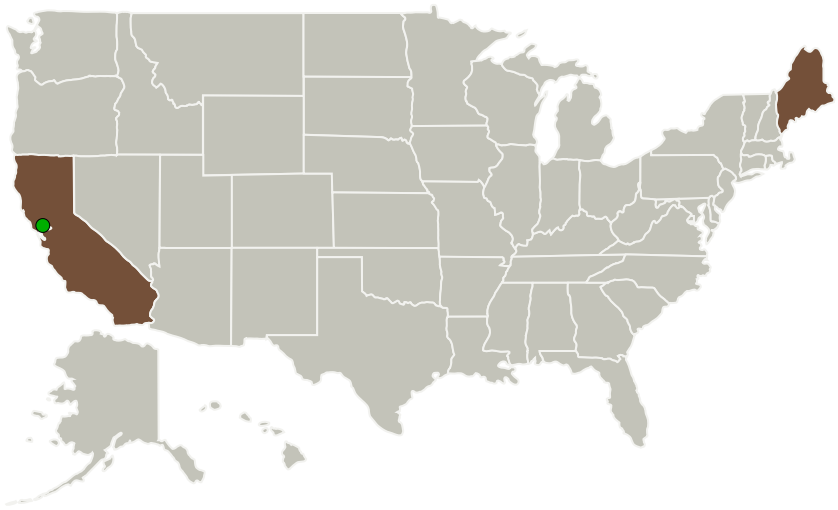
Graded Density Carbon Bonded Carbon Fiber (CBCF) Preforms for Lightweight Ablative Thermal Protection Systems (TPS), Phase I

Completed Technology Project (2011 - 2011)

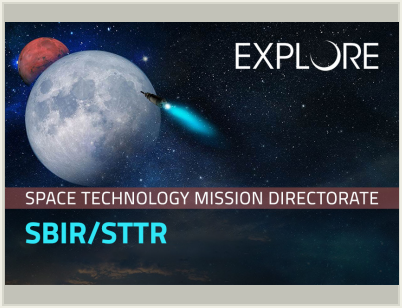
Project Introduction

FMI currently manufactures Phenolic Impregnated Carbon Ablator (PICA) material for Thermal Protection Systems (TPS) systems, such as the Stardust Sample Return Capsule and the Mars Science Laboratory Aeroshell. FMI plans to further develop TPS in support of future sample return missions such as MoonRise and OSIRIS-REx. Development of a PICA TPS with reduced mass, thermal performance enhancements, and optimized single-section near net-shape preforms are enabling technologies for these applications. It is the objective of the proposed program to develop a graded density preform to achieve a reduction in PICA TPS areal mass, to assess the performance of such a TPS, and to develop a plan for manufacturing scale-up.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Fiber Materials, Inc.	Lead Organization	Industry	Biddeford, Maine
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



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Primary U.S. Work Locations	
California	Maine

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139747)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Fiber Materials, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

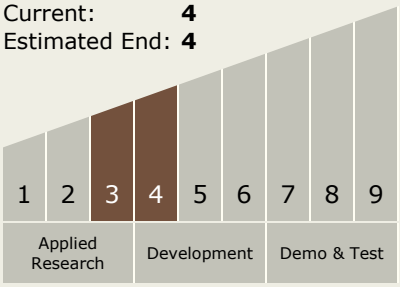
Carlos Torrez

Principal Investigator:

Steven Violette

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.1 Aeroassist and Atmospheric Entry
    - TX09.1.1 Thermal Protection Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System